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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/002,035	11/01/2001	Jeffrey W. Carr	CARR-01000US1	5043

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EXAMINER

OLSEN, ALLAN W

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 04/25/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

10/002,035

Applicant(s)

CARR, JEFFREY W.

Examiner

Allan W. Olsen

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 18-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 18-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 May 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-15, 18-20 and 27 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 1 and 27 each includes a limitation pertaining to injecting a reactive species into the plasma such that "the reactive species dissociates primarily past the energy input zone" of the plasma. The examiner notes that paragraph [0041] of the specification (page 17), which is a discussion of figure 2, is directed to content that is similar in nature to that which Applicant's are claiming in claims 1 and 27. However, in figure 2, the Examiner does not find support for a limitation requiring the reactive species to dissociate primarily past the energy input zone of the plasma. The graphs in figure 2 are said to show that the number of atomic species within the plasma reaches a maximum near the tip of the visible discharge (between points 3 and 4 of figure 2). However, the Examiner notes that the number of atomic species, as indicated by the relative area under the graphs in figure 2, actually declines as the distance from the energy input zone increases. The number of atomic species appears to be at a maximum between points 1 and 2. The examiner notes that figure 2 does depict a

radial distribution profile in which the number of atomic species reaches a maximum near the tip of the visible discharge (between points 3 and 4). However this maximum only reflects those species that are located on or near the central axis of the annular plasma. This local maximum in the number of atomic species is beyond the energy input zone of the plasma, however, this does not translate to, or provide support for the claimed limitation that the actual dissociation process, for the plasma as a whole, takes place primarily past the energy input zone. As noted above, figure 2 indicates that the number of atomic species within the plasma actually declines as the distance from the energy input zone increases. Furthermore, figure 2 indicates that a very significant percentage of the dissociation has already occurred at position 1 of figure 2. Therefore, it is not apparent how one could meet a limitation with the requirement that "the reactive species dissociates primarily past the energy input zone".

Claim 30 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The examiner finds no disclosure pertaining to the use of an auxiliary gas to affect the temperature of a reactive gas before the reactive gas contacts the plasma.

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15 and 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 recites "...using silicon hexafluoride (SF₆) ...". The named chemical, silicon hexafluoride, has a molecular formula of SiF₆ rather than the recited formula SF₆, which is the molecular formula of sulfur hexafluoride.

The term "primarily" in claim 1 is a relative term that renders claim 1 indefinite. The term "primarily" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Claims 2-15 and 18-20 are rendered indefinite by virtue of their dependency upon claim 1.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 21, 25, 26, 28, 29 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Zarowin et al. in Rapid, Non-Contact, Damage Free Shaping of Optical & Other Surfaces with Plasma Assisted Chemical Etching, 43rd Annual Symposium on Frequency Control 1989, 623-626 (hereinafter, Zarowin Symp'89).

Zarowin Symp'89 teaches using a reactive atom plasma to shape and polish substrates in a damage-free manner. The process includes bringing about the dissociation of the reactive species by introducing the reactive species into an annular plasma. See the entire document.

Claims 25, 26, 29 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5,336,355 issued to Zarowin et al. (hereinafter, Zarowin '355).

Zarowin '355 teaches using a reactive atom plasma to shape and polish substrates in a damage-free manner. The process includes bringing about the dissociation of the reactive species by introducing the reactive species into an annular plasma. See column 1, lines 13-16, column 2, lines 30-40; column 3, lines 15-33; column 5, line 15 - column 6, line 35.

Claims 22-26, 28, 29 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Siniaguine et al. in WO 97/45856 (hereinafter, Siniaguine).

Siniaguine teaches using an atmospheric pressure plasma jet to bring about a damage free shaping of a substrate's surface. Siniaguine teaches entraining a reactive gas or reactive gas precursor in the flow of an inert carrier gas and dissociating the reactive gas by supplying the gas mixture to an annular plasma. See: page 2, lines 10-11; page 3, lines 9, 10 and 30; page 12, lines 14-20.

Response to Arguments

Applicant's arguments with respect to claims 1-15 and 18-20 have been considered but are moot in view of the new grounds of rejection.

Conclusion

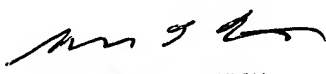
Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 703-306-9075. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck, can be reached on 703-308-2333.

The general fax numbers for TC1700 are 703-872-9310 (non-after finals) and 703-872-9311(after-final). Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Allan Olsen, Ph.D.
April 19, 2003



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